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EDITORIAL

THE STABILIZATION OF AMERICAN MEDICINE.

Efficiency is the measure of success in every enterprise. The profession of this country may well be proud of the record for the past eighteen months, with nearly forty thousand of its membership in the field of duty at home and abroad. Of these, more than thirty thousand were volunteers, who, with a few months at most, and many with but a few weeks of training, assumed duty entirely new in many of its requirements. Just as the soldier in the rank and file has satisfied every one in his splendid achievements, so, also, has the American physician made good.

When the survey of medical men in the United States was made,

something like 140,000 names appeared on the list, made up of all sorts and conditions of men. The age limit of fifty-five eliminated some from service, and the conditions of fitness on account of irregularity of practice removed others from the available list. Conservative calculations put the possible number of physically and mentally acceptable men at about 60,000 to 70,000, of whom probably one-third were absolutely needed at home. The enrollment of medical officers has fully satisfied all demands, and their experience in service will have justified their patriotic response to the call.

The President of the United States and the War Department have decided upon the rapid retirement of all men who are not actually needed, and the mustering out of thousands of doctors is now in progress. Their communities will welcome the return of all these citizens, and they will surely bring to their homes much of the spirit of new enterprise which the army-life and experience have taught them.

In the meantime every community has suffered in some degree. The normal needs of the people have in part been satisfied. In the recent, and even now present, influenza epidemic, there have not been physicians enough, and the large death toll among the profession itself indubitably proves that the profession was much overworked in meeting the demands of the public need. The normal ratio of physicians to the population in the United States for many years has been as 1 to 500 or 600 (140,000 doctors to 110,000,000 people); with a reduction by 40,000, the ratio dropped to 1 to 1,000 or 1,100. The experience in such a universal pandemic has shown that there are not too many physicians normally, and that such a reduction as war has brought materially affects the health and healthfulness of the people in this country. The organized medical profession must deliberate this problem hereafter, especially as it relates to the supply of and demand for doctors.

Medical education, and the institutions which furnish it, have been the subjects of adjustment for the past ten years and the models have been derived from European standards. With the reconstruction of our politics, morals and general habits of life, it would seem to be the time to think about medical education in its relation to the public needs.

We have gone very far in making high standards, which have reduced the student classes by fully fifty per cent, and thereby the output of doctors has decreased proportionately. Scientific training

has largely shelved the mere practical, old-fashioned clinical methods which an intern year may in some degree compensate.

These things have been active in throwing obstructions in the way of the student of ordinary means and of ordinary minds, and have already pointed to the profession of medicine as one to be engaged in by men of special qualification and special training. The youth of meager resources in the way of money finds the cost of a medical education burdensome, and the schools themselves, which are not privately endowed or sufficiently supported by the State, find the cost of operation a constantly increasing problem of finance and adjustment.

It only needed the tragic experiment of the S. A. T. C. in the medical schools to add a knockout blow to the enthusiasm of teachers in medical schools. From the beginning managed by military authorities without proper regard to curriculum or college standards, abusing the schedule and study periods by forced military regulations which, though afterwards amended, finally broke down the morale of almost every medical student enrolled in a military army unit, its whole scheme has demonstrated the frequently observed better hindsight than foresight which has been characteristic of some of the plans and schemes evolved in our war experience. No matter how well it may have been intended, the S. A. T. C. for medical colleges almost everywhere successfully destroyed all attempt at sustained standards, regular teaching or real morale in the student body. At our institutions, as soon as the most welcome demobilization order became effective, the authorities of the schools, in sympathy with the student bodies, put the months of September, October, November and December in the discard and adjourned school to the first of January, in order that the student body and the faculties might be stabilized and ready for efficient work in the new year, even if it should take all of next summer to complete the regular courses.

The future of the medical profession in the United States needs stability to go forward. The public should now and hereafter appreciate the need of coöperation for a better concept of State medicine as it applies to the practice of medicine.

With the standardization of hospitals and their administration for the advancement of medical education as well as for the proletarian purposes usually fulfilled, some lines of advance will be opened up. The spirit of victory in the achievement of our recent

war experiences should spur all medical men to get the tread "which leads to enterprise."

There must be a systematic effort to encourage the youth of today to realize the wonderful opportunities in the study of medicine, and such vocational selection should be stimulated in the boys and girls who are yet in the high schools and who are coming on The intelligent preparation for commencing the study of medicine means much in the year of the actual medical course. The whole plan of successful medical practice, from the point of State medicine, demands that these problems be worked out and their results demonstrated.

HAPPY NEW YEAR!

There is every reason to believe that 1919 should prove a better year for practically everybody than the last few—if for no other reason than that the war is over.

First and foremost, the thought that the slaughter, the atrocities, the suffering, the privations "over there" have stopped, must lift an awful load from the souls of all who really think and feel.

Here we have a right to expect that the absence or scarcity of many things and the exorbitant prices will gradually diminish, no matter how slowly. Normal conditions, little by little, will be reestablished and, as far as we are concerned, we shall not have to account to Uncle Sam for every sheet of paper we use.

According to the law of chances, we are not likely to have any outbreak comparable in morbidity or mortality like that of influenza we suffered last year.

Finally, **the boys are coming home,** the young boys and the older boys, the doctor boys as well as the others; and those whose boys do not come know they have not been called in vain and will await in peace the time when they can join them for eternity.

ORIGINAL ARTICLES

(No paper published or to be published in any other medical journal will be accepted for this department. All papers must be in the hands of the Editors on the tenth day of the month preceding that in which they are expected to appear. Reprints may be had at reasonable rates if a WRITTEN order for the same accompany the paper.)

LOCAL ANESTHESIA FOR OPERATIONS FOR GOITER.*

By A. A. KELLER, M. D.

Adjunct Professor of Surgery, Loyola Post-Graduate School of Medicine; Visiting Surgeon, Charity Hospital, New Orleans.

The growing fear and dread of the general anesthetic and its many contra-indications, especially in goiter of the exophthalmic type of long standing, a previous attack of apoplexy, general tuberculosis, intra-thoracic goiters and those complicated with cardio-renal disease, and the ease with which these cases may be operated on under local, together with the growing demand of the rapidly learning layman that local rather than general anesthesia may be used, prompts me to read about it to-day.

The question of the patient's mental attitude must be given very careful consideration. Oftentimes it amounts simply to the fear of being hurt. This is not difficult to get around, particularly if the patient knows of other cases that have been successfully operated on under local anesthesia. Many times, however, there is an unconquerable dread of being conscious and knowing what is going on, which has nothing to do with the fear of pain. When this exists, nothing but a general anesthetic will suffice.

The development of various forms of anesthesia has not kept pace with the advancement of surgical technic. Generally speaking, there is about as much hazard to the patient from the administration of a general anesthetic as there is from the performance of a major operation itself in competent hands. This statement applies both to the immediate and remote effects of the anesthetic. Medical men have been so engrossed with matters of surgical technic that only too often the question of the anesthetic has been given scant consideration.

The secret of success in the use of local anesthesia is the avoidance of giving pain to the patient. This requires a careful and

* Read at the 39th Annual Meeting, Louisiana State Medical Society, New Orleans, April 16, 17, 18, 1918.

painstaking technic, and demands time and patience on the part of the operator and extreme gentleness in the handling of tissues, and for this reason will never become popular with some surgeons. The mere injecting of an anesthetic solution into the skin along the line of incision will not do; nothing but the complete blocking of all the sensory nerves supplying the region will suffice. See that your patient is made perfectly comfortable on the table, as it is most essential that she be not restless. Have an unsterile nurse, or "moral anesthetist," to sit at the head of the table, screened from the operation, to talk to the patient and fan her if necessary. Assure the patient that the procedure will be painless, aiding, if necessary, with a preliminary dose of morphia. Do not fail to tell the patient when the first puncture is about to be made, as this restores confidence and makes for a satisfactory mental attitude. As small a thing as this at the beginning may mean success or complete failure in carrying out a satisfactory procedure. A fact to be well borne in mind is that the effect of the solution is not immediate, oftentimes requiring twenty to thirty minutes to permeate all structures, and a little time and gentle pressure over the area are necessary before the tissues are insensible to pain; so the incision should not be made immediately after injecting the skin, lest an unanesthetized area be entered and gives pain, thus causing throughout the operation that fear of pain which tends to make the patient restless and distracts the operator and questions the dependability of the particular analgesic in use.

Anesthesia Classification.—Infiltration anesthesia is the production of freedom from painful manipulation by saturating the tissues with the solution in the region to be operated upon—that is, anesthetizing terminal nerve filaments.

Conduction anesthesia means the interruption of sensation by injecting the nerve or nerve trunks that supply the area to be operated by injecting the solution into the nerve substance, its sheath, or immediately surrounding it. These two forms of injecting anesthesia are quite different, theoretically, but practically are similar, and both are used in my work; especially so is the infiltration method.

Very essential for surgery under local anesthesia is a thorough, definite knowledge of the regional anatomy and nerve supply and a knowledge of which structures require better infiltration. The skin needs much care, the sub-cuticular and fat little, muscle a medium

amount. This knowledge is hardly less important than gentleness and respect for tissues.

Going back to your anatomy, you will recall that all the nerves supplying the front and side of the lower part of the neck arise from the cervical plexus and emerge from the posterior border of the sternomastoid muscle at its midpoint, and for an inch and a half downward, the transverse cervical and the inner, middle and outer supra-clavicular nerves.

Braun blocks the posterior border of the muscle by deep, massive injections, then with a long, fine needle subcutaneous injections are made, blocking out a rhomboid figure, completely surrounding the area occupied by the goiter.

The assistant should see that the tray is well supplied with syringes that will work, a number of large and fine needles that are not worn from rust or dulled from overuse, knives that are sharp. These are absolutely essential, for, if tension or pressure is made in the use of improper instruments, pain is produced, and there is nothing so disturbing to the surgeon and patient as to be handicappped by the use of faulty instruments.

ANESTHETIC.—Novocain, which is easily sterilized, is the ideal, effectual non-toxic drug used in my local anesthesia operations. Some surgeons have used as much as fifteen grains at a time, with no untoward results, though it is rarely necessary to use more than three or four ounces of a one-fourth or one-half per cent solution. It does not inhibit healing, nor does it make the area more susceptible to infection.

A more recent local anesthetic, apothesine, introduced experimentally in 1916, used in same strength as novocain, made popular by the scarcity of novocain brought about by the war, very much inferior to novocain, is being used by a great many surgeons today. I have used it successfully doing other major operations, and expect to use it in goiter surgery.

It is not a wise plan to combine adrenalin with your local in doing thyroidectomies, for the field of operation is so greatly supplied with arterioles and capillaries that danger of post-operative hematoma is very great—a very unpleasant and distressing and unwelcome interference to the comfort of the patient and cosmetic effect of the operation—and a careful surgeon will never "close up" a thyroid field until he is absolutely certain every little bleeder has been clamped and tied.

Wolfer is credited with the earliest ligation of vessels for the relief of thyrotoxicosis, and those on whom the earliest symptoms are noticed, possibly before the eye symptoms are present, the ligation of vessels will undoubtedly arrest the disease. For bipolar, and vessel ligation particularly, is local anesthesia indicated, especially so in the large group of severe cases of hyperthyroidism with the secondary symptoms of dilated heart, fatty liver, soft spleen, diseased kidneys, ligation is of practical value, and local should be the anesthesia, for in these cases general anesthesia is exceedingly dangerous, the operation is one of very short duration and the shock following general anesthesia very much worse than the shock following the operation itself. This is a very simple undertaking under local, the thorough anesthesia of skin at a point over upper pole, anesthesia of fat and platysma, waiting with gentle pressure over anesthetized area for a few moments, a small incision down to muscle, massive infiltration of gland, exposure of upper pole, with isolation of superior thyroid artery, and ligation.

TECHNIC.—*Partial Lobectomy and Thyroidectomy:* The Kocher or transverse collar incision is the one of choice, for its many advantages, especially in women, where the glandular disturbance is so frequent, it permitting free exposure of the gland, drainage at the lowest possible point, and is easily hidden by a low collar or string of beads or LaValliere, and leaves no deformity to annoy her later on. We thoroughly anesthetize the skin along the line of incision, followed by the sub-cuticular and fat, then muscle infiltration anesthesia. The skin flap, down to muscle, is dissected upwards to a point level to the upper pole; all superficial bleeding vessels are clamped and tied. The sterno-mastoid muscles on each side are infiltrated with several massive injections of anesthesia to block the nerve supply, the 2-3-4 of the cervical plexus emerging from the posterior border. The sterno-mastoid on either side is dissected from the underlying tissues and retracted. During this stage the sterno-mastoid branches of the superior thyroid arteries, which are often of considerable size, will be ligated and divided. The anterior jugular veins are now seen, as they lie in the space of Burns, which, in a normal patient, are so small that they can hardly be discovered, are larger in these cases than the external jugular in a normal patient, are dissected free and divided between ligatures, and in this way we undoubtedly dispose of one of the sources of trouble in these cases, because it seems likely that the venous

stasis which is accomplished in the presence of these larger veins has something to do with the hyperthyroidism. The pretracheal muscles, sterno-hyoid, sterno-thyroid, omo-hyoid, often covered by layer of platysma, are well infiltrated and divided in median line as they cross the isthmus of the thyroid, and are carefully dissected laterally. It is at this stage that the dissection must be carefully carried out, for the muscles lie adjacent to the thin-walled superficial veins of the gland, which are very easily punctured and bleed profusely.

As a rule, it is necessary to divide the anterior muscle in only 10 per cent of thyroidectomies. It is when these muscles are unusually tense and the gland unusually large and cannot be delivered through the retracted edges, that we resort to section. When necessary, apply two large clamps 2 c. m. apart and cut between them. In this way the edges can be more easily sutured together after the gland is removed. The gland, now well exposed, is well infiltrated. Enucleation of gland, by elevating with index finger, left hand, and application of large curved clamps into capsule at base of gland, follows, care being exercised to grasp the superior and inferior thyroid arteries in your clamps, never cutting, unless it be between two clamps. The thyroid, very often adherent to trachea, is cut away from the trachea, having a number of clamps to stop bleeding points. After tying off all bleeding points and clamped vessels with plain catgut, carefully inspect the field, suture the severed anterior muscles with plain catgut, a drain of about ten twisted strands of silkworm-gut put in at lowest point of medium line, fascia and fat of skin flap sutured with five or six tension catgut, interrupted sutures, and skin closed with fine plain No. 0 catgut sub-cuticular. The patient should be removed to his room with very little, if any, shock. None of the alarming, distressing after-effects of a general anesthetic; non-stimulating liquids freely. Drain removed in twenty-four hours; sitting up on third day, and usually leaves the hospital on the fifth day.

SUMMARY.—1. Remember that you are operating on a live patient.

2. The patient's life is not endangered by dosage sufficient to induce local anesthesia.

3. You should have a definite knowledge of the regional anatomy and nerve supply, and a knowledge of which structures require infiltration.

4. The general comfort of the patient after operation is much improved, because of lessened trauma to tissues.

5. It is absolutely essential that you have needles and syringes that will work, together with sharp instruments, for a dull knife or scissors tends to chew the tissues.

6. Keep your promise to your patient, for, if your first incision is painful, the effect on the patient is so demoralizing he is forever in fear of pain.

7. Convalescence is not complicated by the anesthetic, and is thereby shortened.

Case Reports.

Reviewing the statistics of goiter surgery of the New Orleans Charity Hospital for the past five years, during which period of time it has been my good fortune to be on the staff of our chairman on section surgery, and to whose kindness I am indebted for the use of the material, there was a total of 149 operations for goiter. Of this number, 104 were performed under general and 45 under local anesthesia. Of these 45 operations under local anesthesia, 11 were vessel ligations, 2 bipolar ligations, 4 lobectomies, 4 complete thyroidectomies for exophthalmus, and 24 complete thyroidectomies for the simple cystic colloid goiter. A few vessel ligations were done under Schleich solution, two complete thyroidectomies for cystic goiter performed with apothesine, and the remaining number operated on with novocain.

Discussion on the Paper of Dr. Keller.

Dr. Isidore Cohn, New Orleans: I have listened with a great deal of pleasure to Dr. Keller's paper, and there are two or three points in it that appeal to me. The secret of success, I believe, depended largely on preventing pain. Personally, I believe it depends largely on the confidence that the patient has in the operating surgeon primarily, or he would not let him operate without a general anesthetic. Having established the confidence of the patient in you, it makes the operation easier; but if you inspire the patient with the idea that you are going to hurt him a little, you will inject more of the local anesthetic. A point which is very often lost sight of in using the hypodermic syringe for local anesthesia is that we forget the key to success is intradermal injections, and not hypodermal. The sensory terminal filaments of the nerves are in the layers of the skin, and not under it. If you make injections in the skin, you can make your preliminary incision without trouble.

The essayist spoke of using apothesine, and said it is inferior to novocain. I used to hold to the use of novocain until the Germans beat us out of it and we can get no more, but I am grateful that I have been

using apothesine in the out-patient department of the Touro Infirmary for a year and a half. Over there we are doing almost every kind of operation with apothesine. In the ward service we have done hernias, removed fibroids, operated on carbuncles, removed lipomas, and almost anything else which comes within the field of local anesthesia, with one-half of 1 per cent apothesine, with no more discomfort to the patient than we have had from cocain, stovain, novocain or any of the balance of them. It possesses the distinct advantage that it can be sterilized easily by boiling and can be used. I have not yet found out how much it takes to poison a patient. It does not have the effect that stovain has, of producing a certain amount of sloughing of tissue. For our work, apothesine has been a great thing.

As to the question of bad cases in which the essayist thought that local anesthesia was particularly indicated, I will say that it was my good fortune three years ago to go through the wards of the Lakeside Hospital, Cleveland, with Dr. Crile on his morning rounds, and see him do ligation in these cases, so-called stealing, and he uses nitrous oxid gas combined with local anesthesia to overcome the psychic side. In these patients the slightest amount of excitement may increase the toxic effect.

Another point is the method of carrying out the process of local anesthesia in the thyroid. Instead of massive infiltration, in the few cases we have had, we have made a low intradermal injection and blocked out the nerves from the tip of the mastoid process in a backward direction along the posterior border of the trapezius down to the level of the acromio-clavicular articulation. In that way we have not been bothered with boggy tissues, with infiltration in front, and we have had no trouble with our results.

The last point I wish to make is in regard to the particular vessel to be ligated. I would like to call your attention to the point of how to get at the inferior thyroid without danger of injuring the recurrent laryngeal nerve. We all know that if we go between the sterno-hyoid muscle and thyroid to get at the inferior thyroid, the recurrent laryngeal nerve lies in that particular fascial plane. If we go between the sterno-hyoid and sterno-thyroid, we have the fascial plane separated from the recurrrent laryngeal nerve, and there is less danger of injurting that particular nerve.

Dr. E. Denegre Martin, New Orleans: I want to corroborate what Dr. Cohn has said with reference to novocain and apothesine for local anesthesia. We have been using apothesine very freely for over a year, so much so that we are using it for everything, and I have been unable to see any difference between it and novocain. Apothesine is non-toxic, regardless of the amount you use. If anything, it probably takes a little longer to produce the anesthetic effect. So far as I am concerned, I don't care whether I get any novocain again as long as I can have apothesine.

The doctor called attention to the importance of blocking the nerves; as soon as we do that, local anesthesia will become more popular.

Dr. J. M. Batchelor, New Orleans: I have had a partial weakness for novocain, but from the little experience I have had with apothesine, if we delay operation somewhat, we will get good anesthesia.

I am very much pleased with Dr. Keller's paper on local anesthesia as applied to operations for goiter, because we know the chief danger of operating on cases of goiter, particularly in advanced cases, is shock and thyrotoxicosis immediately following operation. It is to be presumed

that blocking of the afferent impulse will prevent shock. That has been my experience in surgery of the thyroid under local anesthesia. For two years I have done no operation on the thyroid under a general anesthetic. I find local anesthesia, even without gas, to answer every purpose, and to be preferable.

Dr. A. Keller, New Orleans (closing): In some cases you may be called back to open up your wound on account of a hematoma, and this is annoying to the patient. It makes the effects of the operation unpleasant, and in such cases I find adrenalin is an admirable agent to use in connection with local anesthesia in very many operations, although I would not advise it in thyroid work.

EPIDEMIC MENINGITIS—WITH SPECIAL REFERENCE TO TYPES OF MENINGOCOCCI AND THE TRANSMISSION OF THE DISEASE.*

By CHARLES W. DUVAL, M. D., New Orleans.

The epidemic form of cerebrospinal meningitis is universally recognized as due to the microörganism known as the meningococcus of Weichelbaum. Moreover, extensive observations upon the disease have demonstrated that in whatever country it occurs the lesion is uniformly associated with the same exciting agent. While we have a variety of microbic excitants of meningitis, none but the meningococcus gives rise to the epidemic form.

We owe the discovery of the etiology to the Italian investigator, Celli, who in 1884 first observed the coccus in the meningeal exudate from fatal cases of the disease. However, not until 1887 was the coccus positively identified by Weichelbaum as the sole causal agent of this horrible malady to mankind.

Epidemic meningitis, or spotted fever, as the disease is sometimes called, has prevailed in our country sporadically and in epidemics since 1905. Furthermore, it may be said the disease is pandemic over the world, having in the past three years appeared in practically every European country. Undoubtedly the war is in a large part responsible for its spread and present-day universal distribution.

The disease is an old foe of the armed camp, having ravaged the armies from the earliest times we have any record of, and exacting a frightful toll. It soon made its appearance in the present European armies, and has already attacked our own in the various cantonments throughout the country.

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* Read at the 39th Annual Meeting, Louisiana State Medical Society, New Orleans, April 16, 17, 18, 1918.

As the disease is prone to spread from the armed camp to the civilian population, and particularly to our cities, I have thought it appropriate at this time to present the essential facts of our present knowledge of epidemic meningitis to the attention of the Louisiana State Medical Society, who, after all, are responsible for the health of our community. An intimate knowledge of the specific organism, its mode of transmission, detection, prevention and cure should be an essential part of the cerebral armamentarium of every physician if we are to control this parasitic menace to human life.

The meningococcus is unknown in nature outside the human host. It is spread directly and solely by one individual to another, and such persons have come to be known as carriers. These carriers, while harboring the meningococcus in their nasopharynx, are unaware of any danger they may be to themselves or to others with whom they come in contact. Thus, through the medium of the healthy human carrier, the meningococcus is disseminated, kept alive and propagated. The persistence in a locality of epidemic meningitis is due, not to active cases of the disease, but to the presence of the healthy human carriers who reside in the community, intermingling and moving about freely from place to place.

The meningococcus is harbored and propagated by some carriers for weeks, others for months, and still others for years, which fully explains the vicious circle that is established, since each carrier and each case of meningitis becomes potentially able to disseminate the meningococcus. To break up the circle, the carrier, above all, must be detected and isolated. Prior to the announcement of the English investigators, that the human carrier was the sole means of spread of the disease, we were at a loss to understand the sudden appearance of sporadic cases in a community heretofore free, or new cases in the same community, but having no connection with one another. Our recently-acquired knowledge of the mode of transmission makes this now quite clear.

The meningococcus always enters and leaves the host by way of the secretions from the nasopharynx. It is now established that the coccus, after a sojourn for a longer or shorter period upon the mucous membrane, passes directly back to the meninges via the lymphatics, or indirectly through the blood. Formerly it was thought the infective agent did not travel to the meninges by way of the circulation and that the septicemia and other extra-meningeal lesions seen in cases of epidemic meningitis were the expression of

metastasis. Recent work shows that it is not at all unusual to have a primary blood infection, and in some instances to have meningococcal infection without involvement. This knowledge is of great importance to us from the standpoint of serum treatment. For this reason it is advised, and should be made a routine practice, to administer the antitoxin intravenously as well as intra-spinally in all cases. Whether the meningococcus invades primarily the meninges or the circulation, there is every reason to believe that it sojourns for considerable time in the nasopharyngeal secretion prior to entering the body. On the mucous membrane it would seem to lead a truly saprophytic existence, since here it multiplies freely without exciting any response on the part of the host. At least, there is no evidence of a local inflammatory reaction at the multiplying site, or the development of antibodies detectable in the host serum. Further proof of a saprophytic existence for the meningococcus lies in the fact that carriers remain unaffected by specific serum and vaccin-therapy, the coccus being, as it were, on the outside and independent of the perspective host. The length of time the coccus remains and multiplies upon the nasal mucous membrane may be brief or long, which is tantamount to saying that every meningococcal infection is preceded by the "carrier" state. Since every case of meningitis develops out of a carrier, and we believe that few carriers ever contract the disease, how are the two statements reconciled?

The case that is to develop the infection undoubtedly has had a pre-meningitic stage of short duration in which the organism multiplies upon the mucous membrane of the nasopharynx, and during this brief period the case is in reality a "transient" carrier. On the other hand, if infection is not established early in the case of this type of carrier, the individual becomes what is termed a true or "chronic" carrier, and one who rarely becomes infected. Why the chronic carrier is refractory cannot be explained on the basis of there having been acquired an immunity during the carrier stage, for, in the absence of serological proof, it is demonstrated to the contrary. We can only assume that the human species is, after all, not highly susceptible to meningococcal invasion. In support of this, we have the fact that true, healthy carriers rarely contract the disease, and that they outnumber thirty to one the cases of meningitis developing in any area. It must be borne in mind, however, that the carrier is a danger to a wide and indefinite number of sus-

ceptible persons; and furthermore, because of his healthy state, he is always an unsuspected menace in the community.

Whether it is a true or transient carrier of the meningococcus, the mechanism of dissemination is the same, and consist in the ejection of the nasal secretion into the outside world. Coughing, sneezing, hawking and spitting are the means through which the infectious material is transferred to others who, if near, inhale the finely suspended germ-laden particles of secretion.

The cycle of events which leads to meningococcal infection is now perfectly clear. The carrier, mingling with persons, creates the infection in a number of those susceptible, and increases the number of carriers in those more resistant. Expressed otherwise, the carrier introduced into a group of persons causes a variable number of these to become infected through inhaling his nasal pharyngeal secretion, and a larger number to be converted into transient and chronic carriers of the meningococcus. Hence, the number of carriers produced always exceeds the cases of infection which develop.

It would seem that when the cerebrospinal fever breaks out in a community previously free from the disease the bacteriologist, by following up the clue afforded by the type of coccus present in those first ill, can, by examining the "contacts," and also those who are carriers of this type, identify a large proportion of the carriers of the particular coccus operating. On the other hand, in communities where epidemic meningitis has been prevalent for some time and the carrier rate is relatively high, it would be well to ascertain the community carrier rate as well as the type rate of the local population. In this way the physician will be in a position to form an opinion of the prospect of checking the spread of the disease by isolating the carriers of the type or types locally active.

With regard to types or varieties of the meningococcus, it is now definitely established there are at least four, and possibly others which have not as yet been recognized. Most interesting in this connection is that all types thus far identified are capable of giving rise to epidemic meningitis of equal intensity and degree of severity of the lesion. Of more interest still is the knowledge we now possess that these meningococcal types are serologically not related. The English workers have given us abundant proof that these heretofore regarded "variants" of one species are not the case, but that they represent separate and distinct species. Therefore it is misleading to speak of types or variants, for in reality they are different

microörganisms. from the standpoint of serum-therapy, this knowledge is of the greatest importance, since specific curative measures depend in no small degree upon the recognition of the type-species of infection.

Prior to our knowledge of distinct serological differences for the meningococcus we were at a loss to explain the failure with serum in the treatment of cases in one locality and the good results obtained with the same serum in cases of another locality. These inexplicable discrepancies with antitoxin are now quite readily understood and explained in the light of our recent discovery of distinct species for the meningococcus. The antitoxin produced by any one of the so-called types is only of value in the treatment of the infection caused by that particular meningococcus.

What was formerly thought to be a polyvalent serum, because produced with a number of meningococcal cultures that had been isolated from widely different sources, has in most instances turned out to be nothing more than monovalent serum, because all the cultures used were discovered later to be the same type. While much of the serum on the open market is in this category, I believe that every effort is being made by all producers of commercial antitoxin to correct the unintentional mistake.

From what has been said of meningococci, you will agree with me that it is essential, in the treatment of cerebrospinal fever, to first determine in each case the type of infecting organism. This is readily accomplished, and in a remarkably short period of time, by any one skilled in bacteriological methods. Having determined the type, give preferably the monovalent or homologous serum, both intraspinally and intravenously. Far better results are obtained where the serum is administered into the two systems simultaneously.

In conclusion, let me say just a word relative to the mode of transmission of the disease. The healthy carrier is the chief, if not the sole, vehicle of cerebrospinal fever. Therefore, the carrier must be detected and isolated until free from the coccus, which he harbors and propagates in the nasal and pharyngeal secretions. At present, regretable as it is true, there is no suitable method of rapidly freeing such a carrier of his meningococcus, and until such is discovered we cannot adequately limit the spread of the disease.

Discussion on the Paper of Dr. Duval.

Dr. George S. Bel, New Orleans: In listening to Dr. Duval's paper,

which is probably one of the most scientific we have had presented before the Association, it brought out some very important facts and new facts about meningitis, and he shows that we need not worry about the transmission of the disease except from the human being or the human host. The danger from meningitis, as Prof. Duval brought out just now, is not so much from an individual who is suffering from an acute attack himself, because he is isolated—he is already suspected, and therefore all necessary precautions are taken—as it is when such an individual becomes convalescent and moves around; then he is somewhat of a menace to others. Of course, we realize that an individual who is suffering from an acute meningitis will be somewhat of a menace to the attending physician or nurse or nurses. It is the chronic carrier, because of his peripatetic movements, constantly moving from place to place—the individual who has meningitis organisms in his nasopharyngeal spaces, coming from an unsuspected locality, of a cantonment, for instance, where there are congregated young, strong individuals, who are susceptible at that age to the disease, more so than at any other time, who becomes an entire menace to others. No one suspects that this particular individual is carrying the meningococcus, of whatever species he may be, or whichever term Dr. Duval sees fit to use. It is such individuals that give us all our trouble. Unquestionably we find cases of meningitis breaking out here and there, and, where there have not been any cases in the community, there it is we have this etiological factor in the production of this most deplorable disease, namely, cerebrospinal meningitis. It has occurred to me, and I presume it has to others, that the government authorities and other authorities should advocate vaccination against cerebrospinal meningitis in cantonments and other places, just as they do against typhoid fever. I would like to ask Dr. Duval if that would be reasonable, and what his idea is about prevention in the form of vaccination?

We all know, and Dr. Duval made that plain to me to-night, that we have, in the large majority of cases of cerebrospinal meningitis, bacteriemia, and I believe the proportion is about 70 per cent. If the organisms are in the free circulation as well as spinal fluid and nasopharynx, the idea of administering antitoxin directly or simultaneously into the veins while we are administering it in the spinal canal, seems scientific to me, and I believe Dr. Duval hit the nail on the head when he advised that method of administration. If bacteriology is a science, and we all know to-day it is one of the most important sciences in medicine, and it touches the individual who is suffering from a bacteriemia or a septicemia, and the organisms are in the free circulation, why not meet it in that way directly as well as by the former method, through intraspinal injections only? While it is also best to administer a specific serum for a specific organism, if you can isolate the specific microörganism, and we have an antitoxin for it, monovalent is unquestionably the only type of administration. But if we are in a position where we cannot have a scientific bacteriological examination made by an individual who is competent in that line, or we have not the apparatus and so on, I would advocate the administration of a polyvalent serum now made from the organisms that have been described to-night. I think Dr. Flexner has a serum made of those various microörganisms which Prof. Duval spoke of, and, if that is the case, why not administer a hyperserum when we cannot determine for want of proper knowledge the particular organism or cannot secure the services of a bacteriologist?

What I am driving at is this: if we are practicing in some remote place where it is impossible to have the help of a bacteriologist, why not administer a polyvalent serum made from the Flexner type? The unfortunate condition has been, so far as my experience goes in the treatment of cerebrospinal meningitis, that we do not know the various organisms concerned as etiological factors in the production of the disease, and we have all too frequently administered an antitoxin in a given case, not knowing how it was going to act. It is a well-known fact that the antitoxins we have been using have been woefully deficient in antitoxin; therefore, antitoxin for cerebrospinal meningitis cases has not been effective in very many instances. Heretofore we have been giving serum that was lacking in antitoxin. I would like to ask Dr. Duval if that has not been his experience or the experience of the government, with which he is connected, and the Rockefeller Institute, and tell us what they are doing with that method of treatment?

I would also like to ask Dr. Duval how soon can we recognize the various strains of organisms?

I should judge, from my knowledge of the subject, that we would do as we do in pneumonia—test out the organism—and I would like Dr. Duval to kindly tell me how soon it can be done. A great deal will depend upon that.

Finally, I wish to say that this has been one of the most instructive papers I have heard at this session of the Society. I have been highly edified by it. The paper is eminently scientific and will be of great benefit to us all, both individually and collectively, and I want to thank Dr. Duval personally for presenting it.

Dr. Frank R. Gomila, New Orleans: The question of carriers in the City of New Orleans has certainly been one in which we have been vitally interested, as we have had in the cantonments and surrounding sections sixteen cases, and in several places in the city where there were cases; all contacts were examined, and in one home there were eight carriers that we found, besides a case that was afflicted with the disease. Strange to say, no other case developed in this particular family, considering the particular surroundings that were there. They were the most abominable conditions for meningitis to develop.

The State Board of Health has, in conjunction with the government, done some work in Algiers at the Naval Station. There was one case that developed there, and, out of 800 men who were quartered there, there were several found to be carriers; they were isolated, and there were no further cases that developed. There was another family in which a case of meningitis existed; there were three other people in the house that were carriers, and none of the carriers developed the disease. We were unable to trace any of the cases to any particular source. The method used was to endeavor to get every possible person who has come in contact with a person suffering with the disease, and we have been unable to attribute any case directly to any one particular individual. We have had several cases that were sent home from the draft from the Great Lakes, Illinois, training camp, and the men have reported to the office, and I find it is quite strange that the government should have sent these men away from the cantonment into our midst, to be a bugbear among the population. I addressed a communication to the Surgeon General and asked him why we were not notified of the existing conditions, and I have since found out that they have been sending cases home that proved avirulent—that is, the meningococcus they carried was

supposed to be avirulent, but that is not a definitely settled point. It is possible the meningococcus may be avirulent right now and several days afterwards it may become very virulent; and I want to say that the situation in New Orleans has been handled very nicely along those particular lines.

Dr. S. M. D. Clark, New Orleans: May I ask Dr. Duval would there be any good reason for the attendant or the doctor or nurse to wear these little gauze masks that are being advocated in our cantonment hospitals in pneumonia? They seem to believe that they have minimized infection from that standpoint. It would be interesting to know, from a bacteriological standpoint, whether these masks can be used effectively against the meningococcus or not. If they have any virtue from a practical standpoint, I think we should know it.

A second question I would like to ask him is to tell us the method he has used in destroying the meningococcus in the carriers.

Dr. C. W. Duval, New Orleans (closing): In answer to Dr. Bel, I will say that vaccination in the prevention of meningococcus infection is something that the English have already undertaken, and I daresay before long this country will, in connection with its army men or draft men, try it in the various cantonments. There is every reason to believe that immunity can be had in an individual, whether he is susceptible or not, and a very high degree of immunity, and the English believe this immunity can be raised to the point where it will last for a good many months, so that we can really hope for some results from vaccine-therapy as a preventive of the disease the same as we get now in typhoid vaccination against typhoid. You will all recall that when typhoid vaccine first came out we could get immunity to last for six or eight weeks; then it was increased to several months. Now we can establish an immunity in the individual that will last for several years. The same, I daresay, will be had for meningitis. A vaccine—and this answers Dr. Clark's question—has been used a great deal to eliminate the coccus from the carrier, but without any success. It has been an absolute failure, and we explain that on this ground. As I stated in the paper, the meningococcus in the carrier is not actually within the host; it is in the secretions of the nasopharynx; it is living there as a saprophyte. There is every reason to believe, or rather there is good proof to believe, that is so, because we fail to get any antibody reaction on part of the serum of that individual, and there is no inflammatory reaction at the site where the meningococci are propagated or multiplied, so that the organism is not in the carrier. It is on the outside, and anything you may put into the circulation or into the system that is an anti-substance is going to have no effect. It is very much like trying to wash the dirt off outside of a window by rubbing it on the inside. That explains why vaccine or serum therapy has been of no value in ridding the carrier of the coccus. But certainly vaccine-therapy, to prevent the occurrence of the disease, is going to come into use, and, to repeat what I have already said, I think we will find that will be done extensively in this country when the fall comes around. We do not expect much meningitis during the summer months, but in the fall and winter and early spring we can look for it again, and I believe lots of it.

As to the potency of antitoxin, it is quite true that a great deal of the commercial antitoxin that is being used is of very low potency. Even if it is made up now with these different species that I described, the four species of the English or three species of the American, it is low in potency. It is not very strong in neutralizing the autolytic sub-

stance, and we have no way of standardization, such as we have for antitoxins in diphtheria and tetanus. We determine the potency of the anti-meningococcic serum by the agglutination reaction. Dr. Flexner states that a potent serum should agglutinate the homologous coccus in a dilution of 1 to 2,000. I had occasion to test some of the commercial antitoxin a month or two back at Beauregard for the government, and found it would agglutinate the homologous coccus in a dilution of more than 1 to 50 or 1 to 60. On that basis, it is a poor serum in potency. We must bear in mind that a serum or antitoxin may be poor in agglutinability or power to agglutinate the organism and still be quite a good antitoxin. It may be a potent antitoxin. When the substance is injected into an animal for the purpose of raising the immunity in that animal, various antibodies are developed, neutralizing the antibodies or destroying the antibodies, agglutinins and precipitans, and so forth. They are not developed equally or to the same degree. You may have the agglutinations develop very rapidly, you get a high curve, and your antitoxin or lysins develop very slowly and give you a low curve. The agglutination then is no index to the potency of any antitoxin, so it is a mighty poor way we have at present of standardizing anti-meningococcic serum on this agglutination test.

Dr. Bel also asked how soon can we recognize the type. We can recognize the type extremely early in the disease by doing an agglutination reaction, or the same reaction as we do for typhoid. The agglutinations appear quite early in meningitis cases. In two or three days the agglutinations are quite strong and you can detect them by the agglutination test or agglutination reaction. The way most of them are doing now is to take the blood from a case and test it with the various strains, or four or five species. If there is no cross-reaction, the reaction which we get with a culture tells us right off that that particular culture is the one infecting the individual case. There is no relation between these strains that we have and the pneumococcus strain or between the dysentery strain. There we have true types, with one species, but with meningitis they are in no way related serologically. So, by taking blood and testing it against a stock culture of meningococcus, we can determine the particular type that is infecting. Let me mention another way. We can isolate the organism very quickly from either the blood or the cerebrospinal fluid or from the nasopharynx. In quite a number of cases we must bear in mind that the cerebrospinal fluid at first is clear, and no organisms are demonstrable microscopically, and often cultures fail, but the organism is in the nasopharynx, and the same organism in the nasopharynx is in the cerebrospinal fluid.

It is interesting to note that we have never run across a case of meningitis that has two or more of these meningococcic types. It is always one strain. There is no mixed infection, in other words, of the meningococcus. By using a culture that is sure to be in the nasopharynx—and it is there in enormous numbers in all cases of meningitis—you can quickly isolate and agglutinate with known sera and determine the type.

In answer to Dr. Gomila, I would like to speak of something that was very interesting to me—a survey or determination of carriers in the community. Dr. Flexner was down here not long ago and suggested to me that it would be an excellent thing to make a survey of this community of the City of New Orleans to determine in a community where we might say we have not meningitis. We have the ordinary sporadic case; we have not the epidemic type, and have not had, but we thought

we would like to determine the percentage of carriers we have in our midst—that is, the doubtful type. It requires a lot of workers and requires money, both of which are scarce at this particular time. A doctor, who is a very good friend of mine, when he went back from here, stopped off at Washington at the Surgeon General's office and took the matter up with Col. Russell, and I have since had letters from the government to begin as soon as possible a survey of this community. The government is seeking to have a survey made of various communities all over the country this summer, especially in the big cities near cantonments. It is an excellent thing, and it should be done. It is the only way we can do anything with meningitis infection. I am hoping that in our graduating class this year we may have a few that will volunteer to help out with this work, with this survey of this city for meningitis carriers. Perhaps Dr. Gomila and others in his department will lend us a hand. I am sure he will.

Dr. Clark spoke about wearing masks. I think that is an excellent idea. Last August I was called in consultation in a case in a neighboring State and it was a very virulent case. I told the doctors there in attendance to use masks. I used a mask myself. I think it is well to use a mask or plug the nose with cotton, and then use something over the mouth, either saturated in some antiseptic like bichloride or other agent, but not strong enough to hurt the nasal mucous membrane or the lips, and you will certainly prevent yourself from becoming a carrier. If you are within ten feet of any one who is a carrier or a case with the disease, you are going to inhale the finely divided particles of secretion from that carrier or from that case. The room in which there is one sick with meningitis is saturated with meningococci. There is no question about it, and it is well for every attendant, the nurse or physician in a case of meningitis to protect the face, nose and the mouth against the orgnism, not only for their own protection, but for the people, especially for physicians. The physician becomes a carrier and does not know it. He is unprotected and unsuspected, and many people who are in any way susceptible when they once get this secretion will contract meningitis.

In answer to Dr. Clark's last question, and also in answer to Dr. Bel's question as to how the organism is destroyed, I spoke of it in the last paragraph of my paper. There is no adequate way of getting rid of the coccus in the carrier. The saprophyte lives on the outside, so that nothing in the way of specific treatment, serum or vaccine, does any good. There are those who claim that sprays of dichloramin-T and Dobell's solution are more or less effective, but, while they do good, they do not entirely rid the individual of his meningococcus. It is explained on this ground, that so few of these antiseptic sprays reach all parts of the ethmoidal sinuses. In other words, there are anatomical difficulties in the way of antiseptics getting to the meningococcus, which tucks itself away in these remote crevices so that it cannot be reached. I dare say in the near future we will have something that will rid the carrier of the meningococcus, and it is a serious thing, because, as the English have pointed out to us, an individual may be a carrier for over a year. They have had a case they have followed from day to day, and there have been carriers for more than a year and a half. What are you going to do with such individuals, who are as bad as Typhoid Mary of New York City? There should be some means to isolate carriers and keep such individuals under restraint or confine them in some way in order to get rid of the carriers.

PROCEEDINGS OF THE AMERICAN SOCIETY OF TROPICAL MEDICINE

DIAGNOSTIC METHOD, TREATMENT AND PROPHYLAXIS OF MALARIA AS CONDUCTED IN THE SANITATION OF BRIONI, ISTRIE (AUSTRIA), IN 1899 TO 1902.

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INTRODUCTION.

The beautiful Island of Brioni is the most important of the group of twelve islands in the Adriatic Sea, off the west coast of Istria, from which it is separated by the Canal Di Fasana. The island belongs to Austria and is approximately in latitude 44.53′ N.; longitude 13° 52′ E., southeast of Venice, south of Trieste, and a few miles northwest of Pola, almost opposite to Fort Barbariga.

Brioni seems to have been a very important province of the Roman Empire and Venice; the ruins still to be seen show vestiges of the Roman civilization, and the island probably served as a landing place for the Roman legions and as an important commercial center between Rome and the East. There are found in the island extensive quarries, which have been worked for centureis and have supplied material not only for the palaces and bridges of Venice and the whole Adriatic coast, but in later times also for Vienna and Berlin.

Little is known of Brioni during the period of the Middle Ages, but it has been suggested that the decline of the Greek and subsequently of the Roman civilizations was due to an epidemic of malaria and other parasitic and tropical diseases imported by the legions upon their return from the Orient, and it is not improbable that the same fate befell the island. Proof of this is not lacking, as it is known that Brioni was for many centuries uninhabitable and was a "no man's land" because of the prevalence of malaria.

During the early part of 1800, though Brioni belonged to a noble family of Italy, according to traditions, it became a dependency of Portugal, when a noble Portuguese inherited it by marriage to

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the daughter of the Italian gentleman. It is said that the new owner made unsuccessful attempts to cultivate the land and to populate the island, and that, after years of disappointment, finally gave up all hope and decided to sell the island, but found no purchaser. Malaria became so prevalent in Brioni, and the disease so grave at the time, that the island was commonly known under the name "Isola de la Morte" (Island of the Dead).

With the advent of the Austro-Italian War, Brioni became a province of Austria in 1866, which marked the beginning of the new developments on the island. Several years after, Brioni was purchased by a Swiss gentleman for the small sum, it is said, of about 20,000 gulden ($10,000), and the new owner succeeded, after several years of work, in making improvements in the place to the extent of cultivating grapes and settling a small colony; but in time, like his predecessor, because of the prevalence of malaria, he became discouraged in the enterprise. It is stated that of twelve men who attempted to work the land, all but one died of malaria. At the time I was in Brioni this survivor was employed as a mail-carrier in the place.

About 1880, Herr General Director Paul Kuperweisser, a gentleman of means and of indefatigable energy and enterprise, purchased Brioni for a sum between 40,000 and 80,000 gulden ($20,000 to $40,000). With a keen foresight into the prospective future of the island, Herr Kuperweisser, realizing the sanitation of the place as the first and most essential thing, without loss of time began an energetic campaign against malaria in Brioni. This consisted chiefly in the application of the means known at the time, namely, the treatment of infected persons with quinin and attention to drainage. Through these means he succeeded in a few years in building up a colony of about five hundred inhabitants, erecting a small hotel, several other buildings, and beginning the cultivation of grapes, as well as starting other agricultural enterprises. But the sanitation of Brioni at this stage may be said merely to have been begun.

The discoveries of Ross, Grassi, and the observations of Koch in Africa, all paved the way for the better sanitation of Brioni, and Herr Kuperweisser applied for a commission from the Gesundheitsamt of Vienna to conduct a campaign against malaria in Brioni. The Gesundheitsamt of Vienna reported the petition to the Königliche Institut für Infections Krankheiten, now the Koch

Institute of Berlin, and in 1899 Koch took charge of the sanitation of Brioni.

The first expedition was composed of Prof. Koch, Prof. Paul Frosch and Prof. Elsner. The work of the summer consisted chiefly in the routine of blood examination of all persons in Brioni for the presence of malaria parasites, the energetic treatment with quinin and quinin prophylaxis of all infected cases. The result was satisfactory, and it was found possible to reduce the new cases of malaria in Brioni by about 50 per cent in the first year's work.

In 1901 the writer, desiring to undertake special studies on malaria and tropical diseases, went to Berlin in March and applied as a volunteer worker to the Koch Institute. The abundance of material which Koch had recently brought from Africa, and the courteous reception and personal interest shown him by Professors Koch and Frosch, chief of the scientific department of the institute, soon enabled the writer to familiarize himself with the subject.

In the beginning of May, knowing that a second expedition to Brioni was being organized, I applied for the opportunity to accompany it. The expedition was composed of Prof. Frosch, Prof. Elsner and myself. The work of the summer was the same as the previous year, and, in addition, the routine blood examination of all the inhabitants, and the treatment with quinin of all infected persons and all malarial carriers—that is, all chronic cases of malaria in whose blood the gametes of the parastie was found were quarantined or eliminated from the island; also, as mosquitoes were very abundant in the island, a routine examination of a great number of adult anopheles was conducted, among which some were found to be infected.

The result of the second summer's work was very satisfactory. Malaria was greatly reduced, but still some new cases developed during the season. We returned to Berlin in October, where the routine blood examination was continued through the winter.

A third expedition in 1902 was placed in charge of the writer, who arrived in Brioni at the beginning of April and remained on the island until the beginning of October. During this summer, in addition to the regulations introduced during the previous summer, attention was paid to the destruction of mosquitoes in the adult and larval stages, as well as to the protection of the inhabitants against the bites of mosquitoes, by appropriate screening of windows and doors. Other measures, as outlined below, were systematically fol-

lowed, with the result that not a single new case of malaria occurred during the summer, and Brioni was officially declared to be free from malaria, and has remained so since 1902.

The economic importance of the sanitation of Brioni offers the most impressive example of what can be accomplished in other tropical countries by the proper and systematic application of modern measures in the prophylaxis of tropical and parasitic diseases. Brioni at the present time is the most beautiful garden of the Adriatic Sea. The value of the island, with the eradication of malaria, increased, not by the hundred, but by the thousand per cent. From $40,000, which Herr Kupperweisser paid for Brioni in 1901, I was told the value increased to more than $250,000, and $1,000,000 in 1902, when it was declared malaria-free. Since the year 1902 the agricultural development and embellishment of Brioni have been so marvelous that, at present, luxurious private residences, villas and castles of the royal and aristocratic families of Austria ornament the island. Brioni at present, it may be said, has no rival; not even Ostend equals it as a summer resort, and competes in supremacy only with its Adriatic neighbor, romantic Venice.

How this classic work of the sanitation of a tropical country was accomplished will be described below, with special references to the details concerning the diagnosis, treatment and prophylaxis of malaria.

DIAGNOSIS OF MALARIA.

The characteristic manifestation of a typical malarial infection, which appears with a sudden attack, consisting of a chill, fever and sweating, followed by a quiescent or afebrile stage, and the reappearance at intervals of the same type of attacks with a remarkable periodicity, made a basis for the recognition of this disease by Hippocrates. Furthermore, the fact that while in some cases these attacks occurred every forty-eight hours, in others every seventy-two hours, while in still others, though these attacks were repeated every forty-eight hours, their course was protracted or irregular, led Hippocrates to differentiate the three types of malarial fever, namely, tertian, quartan and subtertian. (Figs. 1, 2, 3 and 4.)

This classification being chiefly based upon acute cases, during the first weeks of the infection, when the periodical attacks are apt to be more regular, naturally failed to include a certain group of atypical chronic cases of malaria which commonly may not present appreciable subjective or objective symptoms.

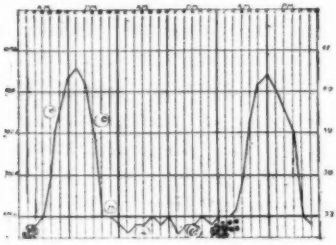

FIG. 1—TERTIAN MALARIA FEVER, SHOWING THE DIFFERENT DEVELOPMENTAL FORMS OF THE MALARIAL PARASITE IN CORRESPONDENCE WITH THE VARIOUS PERIODS OF THE ATTACK.

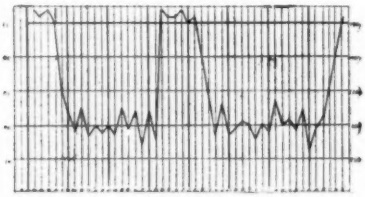

FIG. 2—TEMPERATURE CHART OF DOUBLE TERTIAN MALARIA.

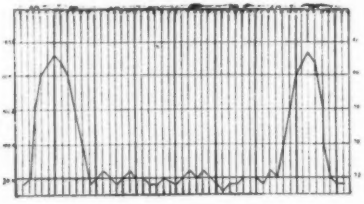

FIG. 3—TEMPERATURE CHART OF QUARTAN MALARIA.

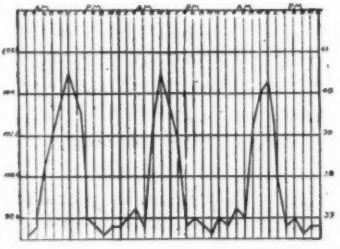

FIG. 4—TEMPERATURE CHART OF SUBTERTIAN MALARIA.

Of great importance in the recognition of these ayptical cases, and the diagnosis of malaria in general, was the importation of quinin into Europe in the sixteenth century, because this drug, being a specific against the malarial parasite, served as a valuable means in the differentiation of malaria from allied diseases. But there again arose another difficulty, when it was found that quinin failed to act against certain forms of the disease. It is now known that, while quinin is effective against the asexual forms of the malaria parasite (trophozoite) common to the early stage of the disease, it has no action against the sexual forms (gametes) characteristic of chronic malaria.

The last link in the diagnostic chain in malaria was the discovery of the parasite in the circulating blood by Laveran in 1880, and this important discovery has not only greatly simplified the diagnosis of the disease, but it has been of great importance in the prophylaxis of malaria, for it is the only means of detecting some chronic cases in which the blood shows the sexual forms of the parasite (gametes), which infect the mosquitoes. The technic is as follows:

(1) Prepare a thin, dry blood preparation on a slide or cover glass; dry and fix in equal parts of alcohol and ether for one to two minutes.

(2) Stain with diluted borax-methylene-blue for two or three minutes.

(3) Wash freely in running water for a few seconds. Dry and examine under the oil immersion lens of the microscope.

The malarial parasite appears stained light blue and the erythrocytes pale green. Romanowsky, Wright, Giemsa or any other polychrome stain may be used and, though they give beautifully contrasting preparations, the use of this staining may be said to be of no practical advantage.

As in chronic cases of malaria the parasite is often present in the blood in such small numbers that it may not be found in the small amount of blood usually examined, it is recommended that larger quantities of blood be used by concentration. Two methods, the one recently recommended by Bass and the other used by the author, may be employed for such purposes with good results.

The Author's Method: Collect about 0.1 c. c. of patient's blood drawn from the finger in a narrow test-tube containing about 1 c. c. to 2 c. c. of a 1 per cent acetic acid solution and gently shake the mixture for from one to three minutes, until complete hemolysis

occurs: (2) centrifugalize from ten to fifteen minutes and, by carefully tilting the tube, pour out the liquid. The sediment remains at the bottom of the tube; (3) collect the sediment with a pipette, make slides of coverglass preparations, dry and fix in equal parts of alcohol and ether for one to two minutes; (4) pour out the alcohol and ether, dry with filter paper, stain with diluted borax-methylene-blue for from two to three minutes, wash freely in running water, dry and examine under the oil immersion of the microscope. The malaria parasite appears light blue among the greenish stained detritus of erythrocytes. The leucocytes are stained deep blue.

This method is especially useful for detecting the gamete forms, and the author has used it with advantage in the diagnosis of malarial carriers. With sufficient experience and careful technic, it is not difficult to detect any of the forms of the malarial parasite which may be found in the blood. (Fig. 5.)

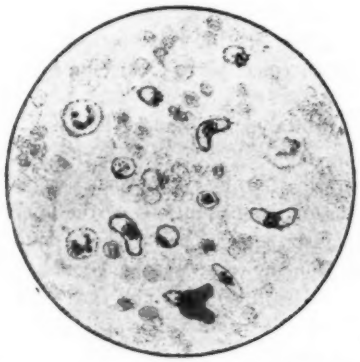

FIG. 5—SEMILUNAR BODIES OR GAMETES OF MALARIA PARASITES (SUBTERTIAN). BLOOD PREPARATION MADE BY AUTHOR'S ACETIC ACID CONCENTRATION METHOD.

Bass Method: (1) Collect 0.5-1 c. c. or more of the patient's blood, drawn from the finger into a narrow test-tube containing an equal amount of an isotonic solution; mix both liquids and centrifugalize for ten to twenty minutes. The parasitized red blood cells and the free malarial parasite (gametes of subtertian, etc.) being lighter than the rest of the erythrocytes, will rise to the upper layer of cells; (2) carefully remove the supernatant liquid and collect in a pipette the upper layer commonly known as the "cream

of the blood"; (3) make dry spreads on slides or coverglass preparations with the material, stain it by Wright's method and examine under microscope.

A more concentrated preparation may be obtained by a further centrifugalization of the material in capillary tubes.

TREATMENT OF MALARIA.

The common knowledge that quinin is a specific against malaria has led the medical profession in general and the laity in particular not only to the indiscriminate use of this drug, but also to regard it as the last and only measure in the treatment of the disease. Koch held the opinion that quinin was the only means necessary for the treatment, prophylaxis and the eradication of malaria from a community, and advocated, in 1899, the use of this drug, to the exclusion of all other prophylactic measures, for the sanitation of Brioni. It was found, after the work of the first year, thanks to the recent discovery of Schaudinn, Ross and Grassi, that, in addition to quinin, prophylactic regulations must be taken into consideration to accomplish that end.

That quinin is a specific against malaria admits of no doubt, but like, with other specifics, it is the proper use, and not the abuse, of the drug which cures the disease. In the proper and rational administration of quinin the following points should be taken into consideration: (1) The preparation of quinin used; (2) mode of administration; (3) dosage; (4) time of administration; (5) duration of treatment.

(1) *Kind of Quinin:* Generally it may be said that the sulphate of quinin should be preferred for administration by mouth, and quinin bimuriaticum for hypodermic injections.

(2) *Mode of Administration:* As a routine procedure, quinin should be given by mouth, the drug being previously dissolved in diluted hydrochloric acid. The administration of quinin in the forms of pills, capsules or cachets, etc., is contraindicated, as they not uncommonly pass through the digestive tract undissolved, and besides, since this alkaloid is chiefly absorbed in the stomach, a capsule or pill may readily pass to the small intestine undissolved. For the same reason, in the treatment of the acute stage of malaria and in the subsequent treatment or as a prophylaxis of the disease, as outlined below, it is preferable to give the quinin on an empty stomach if possible, about four or five hours after a meal, in the

evening before retiring, or in the morning before breakfast, because, under such conditions, quinin is more rapidly absorbed in this organ.

Hypodermic injections, when indicated, are to be preferred to intravenous injections, the latter being used only in emergency, in very severe and grave cases. The hypodermic injection is especiallly useful in those cases in which the administration by the mouth gives rise to nausea and vomiting, or to diarrhea, or when these complications accompany the disease, as in "bilious remittent fever," etc.

() *The Proper Dose of Quinin:* For an adult, no less than fifteen grains (one gram) should be given for a single dose. Twenty, or even thirty, grains may also be given in severe or grave cases of subtertian, when this dose is well borne by the patient. For a child from one to ten or fifteen years old, one to ten or fifteen grains, respectively, are given—that is, one grain for each year. The use of small doses, such as two grains repeated at intervals, commonly prescribed for adults, is contraindicated, for the reason given below.

(4) *Time of Administration of Quinin:* One of the most important points to be considered in the successful treatment of malaria is the time at which quinin should be given. Based on our knowledge concerning the asexual cycle of the malaria parasite in the body, and knowing that the sporulation stage corresponds to the chill, the entrance of the merozoites in the erythrocytes to the febrile stage, which, because of the fact that not all the parasites sporulate at the same time, the period may last for about four to eight hours in tertian and quartan and a longer time in subtertian; that the fall in temperature or crisis corresponds to the early growth of the trophozoite stage; that the febrile period, which lasts forty to forty-four hours in tertian, sixty-four to sixty-eight hours in quartan and twelve hours or less to twenty-four hours longer in subtertian, during which time the trophozoites grow to a schizont, when sporulation again occurs and the cycle is repeated. This clearly shows that the clinical manifestations of a malarial attack is controlled or corresponds to the different phases of the asexual cycle of the malaria parasite in our body, and for practical purposes this may be divided into four stages, namely: (1) Chill-sporulation; (2) fever—entrance of merozoites into the erythrocytes; (3) crisis—beginning growth of the trophozoite; (4) afebrile period—further growth of trophozoite up to the schizont stage.

With this point in, it is reasonable to assume that *the most favorable time for the administration of quinin is during the third stage, or the crisis, just when the temperature begins to fall.* Among other reasons for the administration at this stage two, which are the most important, may be given (1) The parasite at this stage is very young, and consequently is easily destroyed by the drug; (2) at this stage, when the parasite begins its growth, and its metabolic activity is at its highest, it is only natural to assume that during this period of rapid growth it is more apt to take a larger amount of quinin than when it grows older and becomes quiescent.

This biologic fact is manifested in all forms of life and explains, for instance why a child proportionately consumes ten times more food than an adult, and likewise is more susceptible to the action of drugs, or which narcotics may be given as an example.

As the parasite grows older, therefore, the less susceptible it becomes to the action of quinin, until it reaches the schizont stage, when, like the gametes, it may be said to be refractory to the drug.

As for the sporulation stage, this, likewise, may be said to be refractory to the drug, because the merozoites, as readily understood, merely represent a quiescent stage between the schizont and young trophozoite (plasmodium) stages. During this period the merozoite enters the erythrocytes and remains dormant for some time before it becomes adapted to the new environment and begins to grow.

The reason why the malarial parasite remains dormant in the merozoite or ring stage for some time (six to twenty-four hours or longer) after it enters the erythrocyte during the chill, is explicable, perhaps, by a peculiarity in the life-history of the parasite, but it should not be overlooked that the high temperature of the body at this stage (103° to 104° F., 39° to 40° C. or over) is unfavorable for its metabolic activity and growth. If this view is correct, as the writer believes it to be at least a contributing factor, basing his conclusions upon a single observation, it seems that the artificial lowering of the temperature of the body shortly after the chill, by a cold bath or medication, would cause an earlier growth of the shizonti and the administration of quinin at this point would shorten the attack. This point, I believe, is worth while considering, especially in the management of those pernicious types of subtertian malaria in which the fever is prolonged.

The above facts regarding the life-cycle of malaria parasites

clearly show that the essential point in the successful treatment of malaria is not the indiscriminate use of quinin, but the rational use of it—that is, the administration of the drug at the proper time, when the parasite is beginning to grow, which accomplishes the best result. Of course, it is difficult, especially in field work or in atypical cases of malaria, to exactly follow this indication, but under such unfavorable circumstances a single microscopical examination of the blood will suffice in most cases to determine the kind and approximate age of the parasite and predict with sufficient accuracy the time of the following attack, and accordingly instruct the patient as to the time when quinin should be taken.

It is advisable, too, when possible, especially in hospital work, to control the clinical manifestation of an attack of malaria by the microscopical examination of the blood at intervals.

The above line of treatment has been followed by the author in all his cases of malaria in Brioni and elsewhere in the tropics with most successful results, and he has often seen a single dose of quinin, when given at the proper time, completely stop subsequent attacks.

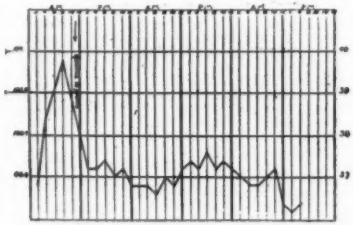

FIG. 6—CHART OF TERTIAN FEVER SHOWING EFFECT OF A SINGLE DOSE OF QUININ, ONE GRAM, GIVEN AT PROPER TIME IN PREVENTING RECURRENCE OF THE ATTACK.

(5) *Duration of Treatment:* The successful treatment of malaria depends upon continuing the administration of quinin for a certain length of time. A single dose of quinin may suffice to free the patient from a subsequent attack, but only temporarily, as usually the fever reappears after weeks or months. To avoid these return attacks the following rule should be followed: Give fifteen grains of quinin when the fever begins to fall and repeat the same dose for three subsequent days at the same hour. No quinin is given during the following four days, after which the same treatment is repeated—that is, fifteen grains for the following three successive days, after which no quinin is given for the following four

days, etc. The treatment, therefore, consists in giving fifteen grains of quinin for three successive days every week, and this should be continued for no less than two, and preferably three months, after which the prophylactic treatment of ten grains of quinin once every week should be taken for the remainder of the season.

The treatment of chronic malaria, those cases which show gametes in their blood or those of long standing in which the parasite may not be found, and which clinically present organic lesions and constitutional and other disturbances, such as enlarged spleen and liver, gastro-intestinal derangements, marked degrees of anemia, etc., are very unsatisfactory.

Tonics: Iron and arsenic are recommended. Of chief importance in such cases is the avoidance of subsequent attacks of reinfection, which aggravate the condition by the prophylactic treatment of quinin, and, when possible, the reinfections should be prevented by the removal of the patient to a non-malarial district, preferably to a high altitude or to a northern climate.

PROPHYLAXIS OF MALARIA.

With our present knowledge concerning malarial fevers and the life-history of the parasite, namely: that while quinin is a valuable specific against the asexual forms of the parasite it has no effect against the sexual forms or gametes; that these sexual forms, when taken by the mosquitoes, during biting undergo evolution in the body of this insect, and that the parasite is transmitted to man by the bite of an infected mosquito, the prophylaxis measures against malaria may be summarized as follows: (1) Routine blood examination; (2) quinin treatment; (3) proper care of malarial carrier; (4) destruction of mosquitoes; (5) quinin prophylaxis.

(1) *Routine Blood Examination:* As a routine procedure, the first attention of the parasitologist and hygienist should be directed to the examination of the blood of all persons, if possible, in the community. The importance of this preliminary precaution can be readily understood, as it is the only means of obtaining the first and most important insight concerning the kind and degree of infection upon which are formulated the future plans for the sanitation of the place.

(2) *Quinin Treatment:* All persons in whose blood malarial parasites are found, whether they present any symptoms of the disease or not, should be treated with quinin in the manner outlined above.

(3) *The Care of Malaria Carriers:* In order to prevent the spread of the infection, all malarial carriers, those which show the presence of the gamete forms of the parasite in their blood, should be isolated or removed to non-infected places, free from mosquitoes, if possible. Not uncommonly this important precaution is difficult or impossible to carry out, but under such circumstances it will be found easy to accomplish the same purpose by instructing the patients to sleep under mosquito nets in order to prevent the bite of mosquitoes.

(4) *Destruction of Mosquitoes:* The mosquitoes are easily and best destroyed in the larval stage by the application of about 1 c. c. of petroleum per square meter surface of water. The oil should be applied to all ponds, slow-flowing creeks, stagnant water, etc., regularly at least every week.

(5) *Quinin Prophylaxis:* This simple and efficient means in the prevention of malaria, as advocated by Koch, consists in taking ten to fifteen grains of quinin, previously dissolved in water, acidulated with hydrochloric acid, once or twice every week during the summer months.

Conclusions.

This brief and simple outline concerning the diagnosis, treatment and prophylaxis of malaria is the one which the author followed in the sanitation of Brioni during the years 1901 and 1902, with the result that, after a work of three summers, the island was declared completely free from the disease. The importance of this work and the result is manifold:

First, it is the best evidence of the marvelous progress which tropical medicine and parasitology, thanks to the geneal discoveries of Laveran, Manson, Ross, Grassi, Koch, Schaudinn and many others, workers in the field, have made in recent years.

Second, the sanitation of Brioni stands preëminently as an example in which, through careful and systematic appliance of modern prophylactic regulations, malaria was successfully eradicated for the first time from a community.

Third, the application of this prophylactic regulation rendered possible the sanitation of the Canal Zone in Panama, and has greatly improved the sanitary condition of other tropical countries here in America and abroad.

It is hoped that the American Governments and philanthropists, moved by the highest of humanitarian principles—the health and

happiness of mankind—in the near future will direct their efforts to give a helping hand to those unfortunate countries of tropical America which still remain oppressed and dormant under the burden of this disease of the tropics, which for centuries has prevented the development of the wealth of natural resources of those regions, to say nothing of the physical and mental qualities of their inhabitants.

Modern medicine, stimulated by the discoveries of Pasteur, has accomplished much in the control and practical eradication of a number of bacterial diseases—diphtheria, typhoid fever, tetanus and others—and this fact gives hope that the day is not far distant when the doctrine established by the French genius, *"C'est dans le pouvoir de l'homme de faire disparaitre toutes les maladies infectieuses de la terre,"* will be an accomplished fact; and, in addition, may follow the eradication of tropical and parasitic diseases from the tropical countries.

NEWS AND COMMENT

ORLEANS PARISH MEDICAL SOCIETY ADOPTS RESOLUTIONS.—The following resolutions were adopted at a meeting of the Orleans Parish Medical Society on November 25, 1918:

Whereas, as the terms of the armistice are being complied with, it becomes evident that the enemies of democracy cannot resume the war; and

Whereas, the needs of medical men in the army and navy in times of peace are measurably less than in times of war; and

Whereas, the visitation of epidemic disease accentuated the shortage of doctors for the civil population and entailed considerable suffering to the people. Since there has been a recrudescence of influenza in Spain and in England, there is such a possibility of a recrudescence in the United States, winter months generally being more favorable to the spread of that disease; and

Whereas, it has been the policy of the government to inflict as few hardships on the civil population in the winning of the war, the return of many of these men to their respective homes would in a large measure mitigate the suffering of the people if they were again confronted with a great outbreak of that or any other disease; therefore be it

Resolved, That the Orleans Parish Medical Society, in the interest of the civil population, petition the Secretaries of the Army and Navy to consider these various points, with the object of de-

mobilizing, as expeditiously as consistent with the efficiency of the service, as many of the doctors in the camps and abroad as possible. Be it further

Resolved, That a copy of this preamble and resolutions be forwarded to the Secretaries of War and Navy, to the NEW ORLEANS MEDICAL AND SURGICAL JOURNAL, and to the *Journal of the American Medical Association,* with a request to publish same.

A CARELESSLY GUARDED GATE.—The *Scientific American,* in an editorial entitled "A Carelessly Guarded Gate," in its issue of November 2, places the blame of the spread of the Spanish influenza on the laxity of the port authorities along the Atlantic seaboard. The editorial severely arraigns both the officers of the Public Health Service on duty at the country's ports and the medical profession.

NEW HOME OF THE H. K. MULFORD COMPANY.—The H. K. Mulford Company, having outgrown their present pharmaceutical laboratories, will soon occupy the modern building located at Broad, Wallace and Fifteenth streets, Philadelphia. The building is of modern construction, being of steel, concrete and stone, nine stories in height, and has a total floor space of nearly ten acres. The equipment has modern labor-saving devices and comforts for employer and employees. This will be the largest building in the world devoted exclusively to the production of medicinal products.

JERUSALEM IS FREED OF MOSQUITOES.—Through the efforts of Louis Cantor, of Rochester, N. Y., a member of the American Zionist Medical Unit, Jerusalem has been freed of the mosquito pest. During Mr. Cantor's campaign 350 cisterns were petrolized and put in sanitary condition. Mr. Cantor was formerly connected with the Goethals Commission at the Panama Canal.

NAVAL BILL TO RETAIN MEDICAL STAFF.—The Bureau of Medicine and Surgery of the Navy is formulating a bill under which all temporary medical officers of the navy shall be offered an opportunity to qualify for an appointment in the permanent establishment in the rank now held.

EXPANSION OF ORTHOPEDIC JOURNAL.—The official publication of the American Orthopedic Association, the *American Journal of Orthopedic Surgery,* which has been the only journal in the English language devoted to orthopedic surgery, will become also the organ of the newly-formed British Orthopedic Association, under the

name of the *Journal of Orthopedic Surgery.* The publication will be issued from the present offices in Boston, under the management of Ernest Gregory. The committees appointed by the British Orthopedic Association are: R. C. Elmslie, M. S., F. R. C. S., editor, London; T. R. Armour, F. R. C. S.; W. H. Trethowan, F. R. C. S., and H. Platt, M. S., F. R. C. S.; while Drs. Charles F. Painter and Robert W. Lovett, of Boston, comprise the committee appointed by the American Orthopedic Association.

NEW NEGRO TRAINING SCHOOL FOR NURSES.—The opening of the free clinic of the Providence Hospital and Training School for Negro Nurses in New Orleans took place December 9, at the home of the hospital, 2517 Delachaise street. This school in New Orleans should prove of great benefit as well as answer a long-felt need.

ELKS' WAR HOSPITAL DEDICATED.—On November 16, 1918, the Elks' Reconstruction Hospital in Boston, for the treatment of wounded and disfigured soldiers, was dedicated and turned over to the government with impressive ceremonies.

GEN. GORGAS HONORED.—Surgeon General William C. Gorgas, U. S. Army, shortly before the armistice was declared, was made a grand officer of the Order of the Crown of Italy, in recognition of his services in military sanitation.

TOURO INFIRMARY CELEBRATES FIFTIETH ANNIVERSARY.—The Touro Infirmary of New Orleans, founded by Judah Touro, celebrated its fiftieth anniversary on December 5, in the Touro Nurses' Home. The occasion was marked by delightful ceremonies, and hundreds of people from all over the city came to participate in the event. The main program, consisting of speeches and music, was followed by a reception to the guests and a demonstration in one of the rooms of the nurses' home of two hospital wards showing methods used in the old days and those used at the present time. During the ceremonies a loving cup was presented to Mr. E. V. Benjamin, president of the board of directors, in appreciation of his services to the hospital during the past eight years.

THE NATIONAL BOARD OF MEDICAL EXAMINERS held examinations in Chicago and New York, from December 2-18, of candidates for licentiateship by this board.

MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.—The Annual Meeting of the American Public Health Association was held in Chicago, December 9-12, with headquarters at Hotel Morrison. All the available information regarding the management of the Spanish influenza epidemic was brought out through the papers read at the meeting and formed the principal subject under discussion. Reference committees were appointed who will report on the various phases of epidemic influenza during the year 1919.

THE KIBLINGER SANITARIUM, of Marksville, La., operated by the Drs. Kiblinger, reports a total of 223 cases during the sixteen months it has been in existence; medical cases were 37, and surgical 186, with only five deaths.

THE SOUTHERN PRACTITIONER INCORPORATED.—Dr. Jeering J. Roberts announces that, owing to impaired health and advanced age, which may any day compel him to desist from editorial work, he has transferred his title and interest in the *Southern Practitioner* to Frederick H. Robinson, managing editor of the *Medical Review of Reviews*, with which journal it will be incorporated and consolidated beginning with the January, 1919, number. For renewal of advertising contracts, subscriptions, etc., apply to Dr. Frederick J. Robinson, 296 Broadway, New York, N. Y.

PERSONALS.—Dr. Oscar Dowling, president of the State Board of Health, was recently elected adjunct professor to take charge of the course of hygiene in the School of Medicine of Tulane University.

Dr. C. Jeff Miller attended the meeting of the Southern Surgical Society, which met in Baltimore, December 17.

Dr. Isadore Dyer, member of the National Board of Medical Examiners, was in New York during the week of the meeting of that board in December.

Dr. R. C. Scott, director of the Laboratory of Hygiene and Tropical Medicine, Tulane University, visited the Boston School of Hygiene during the month in the interest of education along these lines.

REMOVAL.—Dr. W. P. Hickman, from Lecompte to Harvey, La.

DIED.—On December 9, 1918, at Laplace, La., Dr. Sidney Montegut, aged 49 years.

On December 2, 1918, Dr. William E. Brickell, the oldest and at one time one of the most prominent physicians of New Orleans, aged 91 years.

On October 24, 1918, at New Smyrna, Fla., Dr. R. R. Niblack, a graduate of Tulane University, class 1914, aged 27 years.

On November 26, 1918, Dr. Frank E. Burns, of New Orleans.

On November 26, 1918, at Shreveport, La., Dr. R. A. Gray, surgeon and veteran of the Civil War, aged 88 years.

On December 10, 1918, at her home on St. Charles avenue, Adrienne Goslee Matas, wife of Prof. Matas, of Tulane, and mother of Dr. Lucien Landry. Mrs. Matas was an ardent student and her husband's untiring co-worker, and will be much missed by many professional friends, who enjoyed her hospitality and kindly interest while they were students and assistants. The JOURNAL extends its sincere condolence to the bereaved family.

BOOK REVIEWS AND NOTICES

All new publications sent to the JOURNAL *will be appreciated and will invariably be promptly acknowledged under the heading of "Publications Received." While it will be the aim of the* JOURNAL *to review as many of the works accepted as possible, the editors will be guided by the space available and the merit of respective publications. The acceptance of a book implies no obligation to review.*

Principles of Bacteriology, by Arthur E. Eisenberg, A. M., M. D., Cleveland, Ohio. C. V. Mosby & Co., St. Louis, Mo.

The book is devoted to general and special bacteriology, and each group of organisms is classified and tabulated in such manner that practically any necessary information regarding the organism or group of organisms is readily reviewed.

One section of the book is devoted to diseases of unknown causation, while another is given over to discussion of bacteria of soil, air, water and milk. An excellent feature of the book is the complete questionnaire provided in the end to facilitate the review of the subject.

Dr. Eisenberg has incorporated in the book many of the recent contributions to bacteriology, such as Schick's test, Plotz's work on the etiology of typhus, the work of Cole and his co-workers on pneumonia, and Bull on the serum therapy of the gas bacillus.

The book is particularly suited to the needs of medical students who desire facts without having to search pages of text. It is a splendid book for nurses, either in training or for reference after their graduation.

ELIZABETH BASS.

Animal Parasites and Human Disease, by Asa C. Chandler, M. S., Ph. C. Wiley & Sons, Inc., New York.

Most of the text-books on tropical diseases, and also modern works on medicine, give some attention to the parasites which may be involved in

the discussion of diseases. The work before us, however, presents an exhaustive catalogue of animal parasites as related to human disease, and in a manner which not only gives a comprehensive idea of the parasite, but at the same time furnishes an exact understanding of the relation of the parasite to the disease in which it is found.

The classification of the parasites in their own groups, and the consideration of the diseases under each, irrespective of the disease, speaks for a coördination altogether desirable in the plan of arranging diseases and their parasite factors.

Every chapter is interesting and illuminating. Especial note should be given to the statement of the author that the mites of the "itch" are sensitive to cold and do not spread during the winter. As this is quite contrary to the clinical observation of dermatologists, who see many cases of scabies in winter and few or none in summer, there must be some explanation other than the one the author gives. The dermatologists explain it by the freer perspiration and more bathing in summer and by the coverings on the beds in winter.

The text affords not only the best of authoritative reference for the parasites which are so numerously presented, but in the paragraphs dealing with symptomatology and treatment of the diseases an unusual care has been exercised in assembling the modern opinion and practice. Altogether the work is a valuable contribution to current medical literature.

DYER.

Tropical Disease. A Manual of the Diseases of Warm Climates, by Sir Patrick Manson, G. C., M. G., M. D., LL. D. (Aberdeen). Sixth edition. Revised throughout and enlarged. Wm. Wood & Co., New York.

The work of Manson on tropical diseases has been standard for many years and will continue to have its place among references on this subject. With each new edition, however, the revision has been limited to the contents of those which have preceded, and without adequate consideration of the many new conditions described in the current literature. This does not discount the value of the material in the book, but it does argue that the author in another edition should make many additions, even if it means changing the format, which really might be modified to the advantage of the text. Manson and tropical diseases are almost synonymous, so that it is hardly necessary to commend a book which is already almost a **vade mecum** to all physicians interested in the subject.

DYER.

The Practical Medicine Series. Vol. IX. **Skin and Venereal Diseases.** Edited by Oliver S. Ormsby, M. D., and James Herbert Mitchell, M. D. Series 1917. The Year Book Publishers, Chicago.

In small compass, this excellent review of recent literature on the topics named affords a splendid ready source of information for the busy doctor.

DYER.

Naval Hygiene, by James Chambers Pryor, A. M., M. D., Medical Inspector, U. S. Navy. P. Blakiston's Son & Co., Philadelphia.

While considerably a text for those who go to sea in the service of the navy, the book has material of so varied a sort as to make it a valu-

able contribution to the subject of hygiene. The whole subject, as ordinarily covered in texts of hygiene, is presented, and far more—for there are particularization of the practical appreciation of the principles of hygiene and sanitation. Recruiting, swimming, resuscitation of those exposed to drowning, malingering, seasickness, gas, submarines, are some of the subjects not usually found in such texts.

The student of hygiene—even though not concerned with the application to life on a ship—would find ample new material for thought in this work. The excellent illustrations (153 in number) add largely to the value of the text. DYER.

The Seriousness of Venereal Disease, by Sprague Carleton, M. D., F. A. C. S. Paul B. Hoeber, New York, 1918.

A booklet comprising twenty-six plates of actual cases selected for the purpose of impressing upon the lay observer the sometimes terrible effects of venereal infection, especially when neglected, and originally intended as a gift for the use of Base Hospital No. 48. C. C.

Diseases of the Male Urethra, by Irvin S. Koll, B. S., M. D., F. A. C. S. W. B. Saunders Company, Philadelphia and London, 1918.

A short, but rather comprehensive monograph, it is divided into fourteen chapters, two of which (on impotence and sterility) are upon only allied subjects which require greater attention. The best are those treating upon gonorrhea, both acute and chronic. The pre-eminent feature of the work is the collection of beautiful illustrations, including numerous colored plates.

The views expressed are conservative rather than "reactionary," as the author calls some of them, and are heartily approved in the main. C. C.

Genito-Urinary Diseases and Syphilis, by Henry H. Morton, M. D., F. A. C. S.

This is a very complete, though not exhaustive, treatise on the subjects included in the title. It is composed of fifty-two chapters, is illustrated by 330 cuts, thirty-six of which are full-page colored plates and many are original and drawn from cases of the author.

The preliminary chapters, covering especially methods of examination and diagnosis, are particularly good. Those on syphilis are also excellent and brought up to date; however, while we usually try to avoid direct criticism regarding opinions, we must call attention to what we deem an erroneous statement, as it might lead to error on the part of the inexperienced where error and doubt already too often creep in: the author, in describing chancre, states that induration is "constantly present and cartilaginous." Pity 'tis not, as the diagnosis would be much simplified.

Dr. Morton has given an excellent reference book for the student and practitioner, and that it is issued as a fourth edition is only one sign of its merit. C. C.

The Physician's Visiting List. P. Blakiston's Son & Co., Philadelphia, 1919.

This old friend turns up for the sixty-eighth year, much in its usual acceptable form. The dose table is arranged in a better manner. It is presented in three editions—the regular, the perpetual, and the monthly.

PUBLICATIONS RECEIVED

P. BLAKISTON'S SON & CO., Philadelphia, 1918.

Practical Physiological Chemistry, by Philip B. Hawk, M. S., Ph. D. Sixth edition, revised and enlarged.

Physician's Visiting List, 1919.

LEE & FEBIGER, Philadelphia and New York, 1918.

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MORTUARY REPORT OF NEW ORLEANS.

Computed from the Monthly Report of the Board of Health of the City of New Orleans, for October, 1918.

CAUSE.	*White.*	*Colored.*	*Total.*
Typhoid Fever	5	2	7
Intermittent Fever (Malarial Cachexia)	2	2	4
Smallpox			
Measles	1		1
Scarlet Fever			
Whooping Cough	2	2	4
Diphtheria and Croup			
Influenza	866	359	1225
Cholera Nostras			
Pyemia and Septicemia		1	1
Tuberculosis	63	45	108
Cancer	17	6	23
Rheumatism and Gout		1	1
Diabetes	6		6
Alcoholism			
Encephalitis andMeningitis	5	1	6
Locomotor Ataxia			
Congestion, Hemorrhage and Softening of Brain	16	7	23
Paralysis	2		2
Convulsions of Infancy	1	1	2
Other Diseases of Infancy	19	14	33
Teranus			
Other Nervous Diseases	5	2	7
Heart Diseases	62	43	105
Bronchitis	4	4	8
Pneumonia and Broncho-Pneumonia	341	228	569
Other Respiratory Diseases	2	1	3
Ulcer of Stomach	2		2
Other Diseases of the Stomach	2	1	3
Diarrhea, Dysentery and Enteritis	23	23	46
Hernia, Intestinal Obstruction	5	2	7
Cirrhosis of Liver	7	6	13
Other Diseases of the Liver	3		3
Simple Peritonitis			
Appendicitis	6		6
Bright's Disease	23	21	44
Other Genito-Urinary Diseases	14	11	25
Puerperal Diseases	3	3	6
Senile Debility	4	1	5
Suicide	3		3
Injuries	25	20	45
All Other Causes	20	20	40
TOTAL	1559	827	2386

Still-born Children—White, 48; colored, 27; total, 75.

Population of City (estimated)—White, 276,000; colored, 102,000; total, 378,000.

Death Rate fer 1,000 per Annum for Month—White, 67.81; colored, 95.42; total, 74.56. Non-residents excluded, 67.31.

METEOROLOGIC SUMMARY (U. S. Weather Bureau).

Mean atmospheric pressure..... 29.97
Mean temperature..... 75
Total precipitation..... 11.05 inches
Prevailing direction of wind, southeast.

MORTUARY REPORT OF NEW ORLEANS.

Computed from the Monthly Report of the Board of Health of the City of New Orleans, for November, 1918.

CAUSE.	White.	Colored.	Total.
Typhoid Fever	3	------	3
Intermittent Fever (Malarial Cachexia)	1	------	1
Smallpox	------	------	------
Measles	------	------	------
Scarlet Fever	------	------	------
Whooping Cough	1	2	3
Diphtheria and Croup	1	------	1
Influenza	160	66	226
Cholera Nostras	------	------	------
Pyemia and Septicemia	1	------	1
Tuberculosis	38	35	73
Cancer	25	6	31
Rheumatism and Gout	------	2	2
Diabetes	3	------	3
Alcoholism	------	------	------
Encephalitis and Meningitis	2	------	2
Locomotor Ataxia	1	------	1
Congestion, Hemorrhage and Softening of Brain	25	7	32
Paralysis	5	1	6
Convulsions of Infancy	1	1	2
Other Diseases of Infancy	16	8	24
Tetanus	------	1	1
Other Nervous Diseases	5	2	7
Heart Diseases	68	39	107
Bronchitis	5	1	6
Pneumonia and Broncho-Pneumonia	85	61	146
Other Respiratory Diseases	2	------	2
Ulcer of Stomach	1	1	2
Other Diseases of the Stomach	------	------	------
Diarrhea, Dysentery and Enteritis	19	18	37
Hernia, Intestinal Obstruction	------	1	1
Cirrhosis of Liver	5	------	5
Other Diseases of the Liver	1	2	3
Simple Peritonitis	------	------	------
Appendicitis	2	2	4
Bright's Disease	24	13	37
Other Genito-Urinary Diseases	10	5	15
Puerperal Diseases	3	1	4
Senile Debility	5	------	5
Suicide	2	------	2
Injuries	20	16	36
All Other Causes	25	15	40
TOTAL	565	306	871

Still-born Children—White, 25; colored, 21; total, 46.

Population of City (estimated)—White, 276,000; colored, 102,000; total, 378,000.

Death Rate per 1,000 per Annum for month—White, 24.21; colored, 35.51; total, 27.50. Non-residents excluded, 21.88.

METEOROLOGIC SUMMARY (U. S. Weather Bureau).

Mean atmospheric pressure..... 30.08
Mean temperature..... 62
Total precipitation..... 4.46 inches
Prevailing direction of wind, northeast.